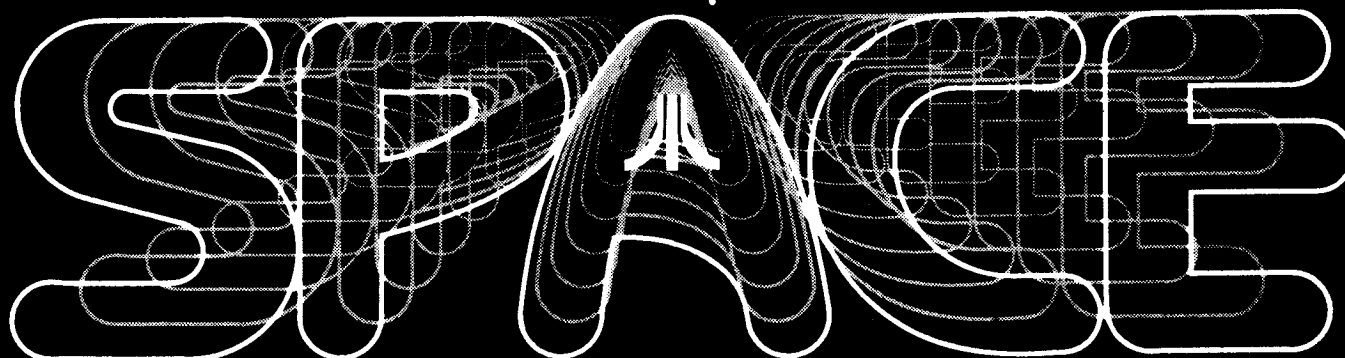


Saint Paul ATARI Computer Enthusiasts



An independent computer user group

AUGUST 1985

Next meeting: Friday, August 9th, 7:30 PM

Notice: The September meeting will be on the third Friday of the month (the 20th) because of a special guest who will be attending from Broderbund Software. I hope you can all make it.

Notice also the new BBS phone number.

Bob Floyd . . . President	487-2627	Jon Nelson . . . Editor	484-9027
Bruce Haug . . . Vice-Pres	774-6226	Max Feuer . . . Treasurer	483-3895
Frank Haug . . . Disk Lib.	774-6226	Bruce Haug . . . Cass Lib.	774-6226
Jim Schulz . . . Paper/Ed. Lib.	537-5442	Steve Pauley . . Secretary	560-2917
SPACE/TAIG Bulletin Board . . . 473-2897			

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Opinions expressed are those of the article authors and do not necessarily reflect the views of SPACE, club officers, members, or Atari Inc.

AT THIS MEETING: A NEW ATARI 520ST. BE SURE TO SEE THIS!

FEATURES IN THIS ISSUE:

PART II OF CHRIS CRAWFORD'S ASSEMBLY LANGUAGE COURSE,

A MEMBER-WRITTEN ARTICLE ON THE COMMODORE 1702 COLOR MONITOR,

NEWS FROM BATTERIES INCLUDED,

AND NEWS FROM OUR PRESIDENT.

THESE PLUS ALL OF OUR REGULAR MONTHLY COLUMNS.

BYTES FROM THE PRES.

by Bob Floyd

One-Year Anniversary - It's now been 1 year since I became "the Pres". It is likewise the same for Bruce Haug as vice-Pres and Jon Nelson as newsletter editor. I think Max Feuer is having his third anniversary with SPACE. Jim Shulz has a few more months to go and I'm not sure how to add up time for Joanne as our secretary (maternity leave). I think it's been a good year for the club. We've almost doubled our membership. We're getting a good turnout at meetings, even in the summertime. ATARI appears to be coming out with the "right stuff" at good prices. Our new meeting place seems to be working out fine, and at even a lower cost than thought (\$21.00/meeting). SPACE now has a set of bylaws. We are selling lots of disks at the meeting, probably due to the DOM being quite a bit improved (thanks Frank). Well, that's enough blowing my own horn. We'll all keep going strong through the fall elections.

520ST's - We will probably have an ST at the next meeting, courtesy of Computer Food. Incidentally, it probably won't be Computer Food much longer. Todd Burkey, Soft Unlimited, and Steve Pauley have formed a joint company (perhaps it will be called Soft Food - sorry guys, I couldn't resist). (Editor's note: Latest word is that it will actually be called 'MindTools'.)

Printshop Public Domain Graphics Disk - The Jersey Atari Computer Society (JACS) has sent me a letter requesting user-created disk files for use with Printshop. They will compile a few disks from clubs across the country and make these available to us when done. Please bring any Printshop graphics disks you have created to the meeting. I will give you a blank disk in return, or get a free disk of the month from Frank Haug.

Secretary Returns - Joanne will resume her duties at this meeting. Thanks, Steve Pauley for the help.

Beginner's Group - The group didn't meet last time due to the confusion up front with demos and a disk drive conking out. We will try again this month.

Supra Corp. - MPP Corp. went bankrupt a few months ago. Supra has bought them out and will continue the product line. It is owned by the same people as MPP.

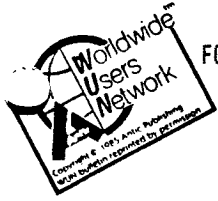
520ST vs. AMIGA - Here's why I think Atari will succeed with the ST and AMIGA will fail. It all boils down to price and market. I doubt whether anyone can penetrate the business market with IBM and Apple in such strong positions already. That leaves the home market. In a comparison between the ST and the AMIGA, the ST is far lower in price, making it much easier for home users to afford. In comparing list prices of comparably equipped machines (512K with RGB color monitor), the Atari is \$1000 vs. \$1700 for AMIGA. True, the AMIGA can do more, but not without additional expenditures. I figure an AMIGA with enough extra goodies to be of sufficient interest will cost about \$2800. Who can afford this for home use? Also, the Atari can be had in a B&W version for \$200 less. I think Atari's main problem will be to convince enough retailers to carry their machines in time for the Xmas rush. The AMIGA will not be in time for Xmas. They have been beaten to the marketplace, this in itself being of great importance. (Note that all prices were suggested retail, and not at the discounts we are used to seeing at SPACE.)

Demo's - We will demo another program that I wrote called "Label-Maker". It's only function is to edit and print up many labels at a time. It supports NEC/Prowriter, Epson MX-80, and Atari 825 printers. However, it can easily be customized for your own printer. It supports print characteristics used by word processors (centering, different fonts, underlining, etc.). It also supports labels of 1, 2, or 3 across. It is handy for disk labels, home canning, etc. We will also bring a few APX games from ANTIC's APX.

ANALOG D.O.M.

Bob & Joanne Floyd

We will have Analog Computing disk for issue #33 at the meeting. Price is \$4.00 for registered Analog subscribers. This is the club's first disk from our subscription. Instructions are now printed out instead of as a disk file. Be sure to pick up a copy when you buy a disk. I will no longer be selling these from the front area. You can find Joanne a few rows up a few minutes before & after the meeting, and buy the disk from her.



CHRIS CRAWFORD
ASSEMBLY LANGUAGE COURSE
FOR WORLDWIDE USERS NETWORK
- LECTURE TWO -

**** 6502 ARITHMETIC ****
NUMBER SYSTEMS

In this lecture I will take up the problem of arithmetic on the 6502. I choose this topic only because it is fairly simple to do on the 6502. There are a couple of nerve-jangling problems associated with 6502 arithmetic, but I will breeze over those in a very cavalier fashion.

Before we can do arithmetic, though, you must know a little bit about number systems. There are three that you must know: decimal, binary, and hexadecimal.

Decimal is the standard numbeat you have used since grade school. You count 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and then you reach 0 again, so you put down a 1 in the tens place and resume counting from 0.

Binary works the same way, except that there are only two digits, not ten. The two digits are 0 and 1. You count 0, then 1, then you reach 0 again, so you put down a 1 in the twos place and resume counting from 0. Thus, counting from 0 to ten in binary like this:

Decimal	Binary
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010

In binary, instead of having ones, tens, and hundreds places, we have ones, twos, fours and eights places. It takes a lot more digits to express a number in binary, but then again, we have only the two numerals 0 and 1 to work with, so what does one expect?

The hexadecimal number system is a base-16 system. In this system, you count from 0 to 16 like so 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,10. The 10 in hexadecimal really means 16 in decimal. So 10 is 16, right? Black is white, truth is likes....stay with assembly language long enough and you'll believe anything.

Actually, it's easy to avoid confusion. We use little prefixes to tell you and the computer whether a number is expressed in decimal, binary, or hexadecimal. No prefix means decimal. A \$ prefix means hexadecimal; a % means binary. Thus %10 means 2 while \$10 means 16, but 10 means just plain old 10. Hexadecimal is not hard to learn at all; if you go into any store you will see that they use hexadecimal on all their signs.

ADDITION AND SUBTRACTION

Addition with the 6502 is very simple; it uses the ADC instruction. This instruction means "Add with Carry"; I'll get to the Carry part in just a moment. For now, let me explain the instruction. The ADC instruction has an

operand, normally a location in memory. When the instruction is executed, it takes the contents of that memory location and adds that value to the value in the accumulator.

It leaves the sum of the two numbers in the accumulator. This of course destorys the old value in the acucmulator. You can use the immediate mode of addressing with the ADC instruction, in which case it adds the value itself. Thus, "ADC # 9" will add a 9 to the contents of the accumulator, while "ADC FISH" will add the contents of address FISH to the accumulator.

Subtraction is just like addition. The instruction to use is SBC, which means "Subtract Borrowing Carry". Again, I'll tell you about the Carry part in a moment. This instruction subtracts the operand from the contents of the accumulator, leaving the reslt in the accumulator. It also can be done in either immediate mode (e.g. SBC#5) or absolute mode (e.g., SBC GOAT).

WORD LENGTH PROBLEMS

If that were all there were to arithmetic with the 6502, programmers would be paid a lot less. The first killer problem is that the 6502 uses 8-bit words; that is, the numbers that the 6502 stores and works with are only 8 bits wide. This means that the biggest number the 6502 can comprehend is 255. Uh-oh! What happens if you want to have a checkbook balancing program and you have more than \$255? What happens if you get more than 255 points in your "Decapitate the Orphans" game? In fact, what happens if you just ignore the limit and add, say, 10 to 250?

Well, believe it or not, the 6502 will give you an answer of 4. Why? The number system that the 6502 uses is like a wheel, with 0 at the top, counting clockwise 1,2,3,...all the way up to 255, which lies right next to the 0. If you go up from 255 you just wrap around past the 0 and start all over. Similarly, if you subtract 2 from 0, you'll get 254.

The solution to all this is provided by the Carry bit, discussion of which I've been putting off until now. The Carry bit is a flag that the 6502 uses to remember when it has done arithmetic that carried it over the boundary between 0 and 255. By using it properly, you can solve your arithmetic problems.

The first trick to using the Carry bit is to use multi-byte words. This means that, instead of using a single byte to store a number, you use several. For example, if you use two bytes to remember a number, you can store a number as large as 65,535. three bytes lets you to to 16,777,215. Four bytes lets you go to 4,294,967,295. big enough for you?

To use multi-byte arithmetic, you set up a series of additions or subtractions. Suppose, for example, that you want to add two two-byte words. The program fragment to do this would look like this:

```
LDA    LOFISH
CLC
ADC    LOGOAT
STA    LOANSR
LDA    HIFISH
ADC    HIGOAT
STA    HIANSR
```

This little fragment of code assumes that the first two-byte value is called (LOGOAT, HIGOAT), and that the , HIANSR). The new instruction, CLC, stands for "Clear Carry" and it means that the Carry bit should be set to 0. It should always be used with all additions except chained additions like this one.

The code does the following: first it adds the two low values. If the addition resulted in a wraparound (result greater than 255), then the Carry bit was set; otherwise, it was cleared. Then it performed the second addition, adding in the value of the Carry bit (That's why we call it "Add with Carry"). Thus, if a wraparound occurred, an additional one was added into the high sum. This system insures that multi-byte addition works properly.

For subtraction, you use the SEC instruction ("Set Carry"). Otherwise, you handle subtraction the same way that you handle addition. In both addition and subtraction, though, the low bytes must be handled first, then the higher bytes in the proper order (lower to higher).

DECIMAL & SIGNED ARITHMETIC

There are two variations on standard 6502 arithmetic. Both are so rarely used that I will not treat them here. The first is decimal arithmetic using the Decimal flag. This allows you to set up an automatic decimal adjust mode. This is useful in certain types of arithmetic, decimal adjust mode. This is useful in certain types of arithmetic, primarily BCD arithmetic.

If you don't know what this is, don't bother with the Decimal flag. Your program should always begin with the instruction CLD, which means "Clear Decimal Flag". I will tell you this just once: failure to clear the decimal flag is the source of the most frustrating and impossible-to-trace bug in the 6502. Every single program should start with the instruction CLD.

The second arcane bit of 6502 arithmetic is signed arithmetic. It uses the V flag ("oVerflow"). Signed arithmetic is always confusing and seldom useful. In 7 years of working with the 6502, I have never had need of it. Don't bother.

LIMITATIONS ON 6502 ARITHMETIC

There are quite a few limitations on 6502 arithmetic. There is no facility for multiplication and division; you have to write subroutines to do that. You must design your programs to make do with 8-bit words; failing in that, you must use multi-byte arithmetic, with its consequent price in speed and RAM. All in all, arithmetic is a real pain on the 6502. This is the major reason why most 6502 programs do so little arithmetic.

D.O.M. News
by Frank Haug

Well, this month's disk is finally put together. I had some trouble putting it together this month. I don't know where some of you people think we get the programs on our disks, we get them mainly from trading with

other groups, but we could sure use some new member-written stuff. Now maybe you're not an expert, but if you have a program you wrote that you think is pretty neat why don't you donate it to the club? After all, how many helpful utilities or great (well at least good) games did you get from the D.O.M.?Sorry to get up on the soap box there, I just don't want to see our group using ONLY other group's programs. THANK YOU to all the members who have donated programs.

Besides the DOM we will be selling a label-making program by Bob Floyd, you can use it to make labels for canning, disks etc. It is written in FORTH but you don't need FORTH to run it. It comes with instructions and it works with a variety of printers.

Now, on with the programs on the August 1985 D.O.M.

1. WATERFALL.BAS - A great GTIA demo. It draws a waterfall with moving current and surrounding scenery.

2. SUB.BAS - Pilot sub, avoid depth charges, use joystick to move, and trigger to fire torpedoes at ships.

3. WORM - Eat enough mushrooms to leave room, avoid running into walls or your own body.

4. GRAVITY - Keep 'ball' in-between top and bottom of screen. Use joystick trigger to make ball go up, let trigger go to let ball fall. When the game starts, choose starting level and push joystick to start ball moving.

5. PONGWAR.BAS - Use paddles or joysticks trying to break through opponents wall while guarding your own.

6. BLOCKADE - Build wall around opponent using joysticks in ports 1 & 2. Avoid the game walls, your opponent's wall, and your own.

7. CRAZY8.COM - This is a compiled card game (crazy eights). The object is to get rid of all your cards first. You must follow suit, but you can change suit by discarding an eight, or playing another card of the same value as the one before it (a 2 on a 2). If you can't discard, you draw a card. After you have 18 cards you must pass. You play against the computer. When the prompt asks for the rank (of the card you're discarding) answer with the first two letters of the card (ex. for a five type FI). When the prompt asks for the type answer with the first two letters of the suit (ex. for hearts type HE).

8. PROGOLF - This is a golfing game and you type the appropriate number to answer the type of club direction etc.

9. DOCMATR - This program will print to the screen or printer any '.DOC' files you

choose. It won't allow any non-text characters to be shown or printed (other than punctuation) it will also do a right justify when it shows/prints the file.

Other DoM Info.

The disk/tape of the month contains programs from the club library. The tapes can be purchased for \$3 and the disks for \$4. The group makes a small profit from the sale of these which go toward supporting some of the things the group does. Each disk/tape usually contains eight to twelve programs. Most of these programs are games with some utilities and demos mixed in. The programs are obtained

from trading with other user groups and from submissions from local members. Members who submit a program will receive a disk or tape of the month free! What a deal!!

For those of you who are new to the D.O.M. here are some operating hints. After you are finished with one program and you want to bring in another, simply hit the break key, and then type in RUN "D:SPMENU". This will return you to the space menu.

Not all of the programs on some of the older D.O.M.'s work I would like someone to make a list of these, and then ask for a volunteer to fix the problems and then I will make up a new disk.

Atari Computers and the Commodore 1702 Color Monitor by Larry Vanden Plas

If you want a very good, reasonably priced color monitor for your Atari 800 or 800XL, get a Commodore 1702 Color Monitor. This advice, which is often found in articles on Atari computers, becomes more compelling when the local COMB stores are selling a refurbished Commodore 1702 color monitor for \$119. If you can spare the money, this article will tell you how to make it happen.

First, get the monitor. But don't just plunk your money down, pick up the box, and walk out with a smile. I did. When I got home and opened the box I found no booklet, warranty or cable. Back to the store, where they were most cooperative. I checked the second box and found that it had paperwork and cable. But when I got home I could not get the power light to go on. Back to the store just before closing. Again they were most cooperative. This time I asked the clerk to hook the monitor up in place of their display monitor, after ensuring paperwork and cable were in the box. It worked fine. I understand problems are common in Commodore equipment. This may be why equipment refurbished by Commodore may be better than new.

Second, get a cable. The 8 pin cable that comes with the monitor does not fit the 5 pin socket of the Ataris. Get a 5 pin DIN plug to 4 RCA plugs shielded cable. My favorite source is Acme Electronics, 224 Washington Ave. No., Minneapolis, MN 55401 (338-4754). They had a nice 72" cable produced by TEI Electronics, Inc., of Hialeah, Florida, for \$3.70 (item #13-181SP1).

Third, hook it up. The connections are:

PLUG	PIN #	DESCRIPTION
White, Center	1	Comp Luma
Outside of all plugs	2	Ground
Black, Center	3	Audio Output
Yellow, Center	4	Comp Video
Red, Center	5	Comp Chroma

With the 800 you have two choices. With the power off, you may plug the yellow RCA plug into the Video socket on the front and the black RCA plug into the audio next to it. Make sure the rear slide switch on the back is set to "front". Carefully push the 5 pin DIN socket into the monitor jack of the 800. When you turn the power on (first monitor, then computer) you should have the equivalent of a very good TV set.

For best results (like a RGB), turn all power off and plug the white RCA plug into the jack on the back of the monitor marked "LUMA", the black RCA plug into the jack marked "AUDIO" and the red RCA plug into the jack marked "CHROMA". With the 5 pin DIN plug securely in the computer monitor jack, turn on the monitor, then the computer.

The 800XL is similar; however, it lacks a chroma output. You may hook it up in the front like the first method for the 800 and it works well. However, if you use the rear jacks on the monitor and put the red RCA plug into the "CHROMA" jack you will have a black and white picture due to the lack of a chroma output on this pin. You may cheat and put the yellow RCA plug (composite video) into the "CHROMA" jack instead. Now you will have a color picture when you turn the power on if you have the slide switch on the back set to "rear". I put electrical tape over the unused red plug.

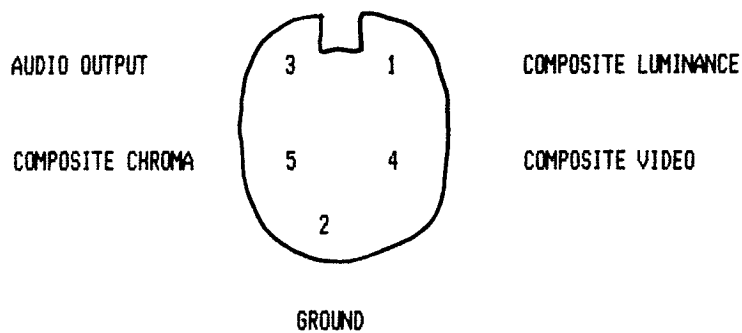
Sorry, I understand neither the 400 nor the 600 was equipped for monitors.

Remember:

1. It is wise to ensure you have your paperwork and the monitor works before you leave the store.
2. Get a 5 pin DIN with 4 RCA plugs.
3. With the power off, carefully push the proper RCA plugs into the marked jacks on the monitor and the 5 pin DIN plug into the socket on the computer marked monitor. Ensure the slide switch on the rear is in the proper position.

For your information, I have included a drawing of the monitor jack below:

-6-



MONITOR JACK (800 ONLY)

* DIN 5 Pin Jack *

You may check the cable you buy with a meter to ensure the colors I quoted are the same connections you have. The drawing above is the jack in the computer. The pin arrangement for the 5 pin DIN plug will be a mirror image of the jack (1 and 3 swapped; 4 and 5 swapped).

Thanks to Jim Buchmann for his advice. May your computing be more productive and your games be more fun.

Reference: Creative Computing, March, 1984, pp. 252-255.

P.S. The third monitor died on the third day of use and the power light would not come on nor would it show any sign of life on the screen. COMB cheerfully gave me my choice of another and extended the 14 day return period. The clerk wanted me leave it plugged awhile after the picture came on the screen. She seemed to know what she was doing. LVP

26 July, 1985

A public statement from Batteries Included regarding our 80 column card for the Atari.

It's always easy and enjoyable to announce good news, but seldom much fun to announce the bad. As Vice President of Development for Batteries Included, it's been a pleasure over the past year to introduce and bring to market such products as HomePak, PaperClip and B/GRAPH for the Atari.

Unfortunately, I now have the unhappy task of having to tell you about the cancellation of our BI-80, 80-column display adaptor cartridge for XL and XE systems.

Rather than simply making an announcement and leaving it at that (many companies cancel products without a word), we have decided that we owe the Atari community an explanation why this decision was made. It may not comfort those who really wanted the product and were waiting with some anticipation, but it might give some insight into why these things happen and the kinds of choices and decisions that are made in this industry.

BI created and marketed the most popular 80 column adaptor for the C-64. About a year ago, when we committed to the Atari market we decided to create an Atari BI-80 as well. We contracted with a well recommended, experienced designer but the design was never completed to our satisfaction.

About six months ago our own senior engineer came up with an innovative, high quality, yet inexpensive design. It used a special custom VLSI chip. We announced it and demonstrated several prototypes at Summer CES. As well, we had several programming teams working on software.

The cornerstone of the BI-80 was its custom chip. The manufacturer promised delivery within 8 weeks of an order. Recently we placed our firm order, with the intention of shipping in September.

Much to our dismay, we have just learned that we will not be able to get our first production chips until January 1986. This is essentially why the BI-80 project has been cancelled.

Without being able to sell this product in the important fall and Christmas markets,

the financial risks--well over a quarter million dollars--are unjustified. Late winter is the worst time of the year in this business to launch a new product.

Also we are ready to introduce updates of HomePak and PaperClip this fall. What to do? Postpone them till spring? Release versions without the BI-80 support and then again when it's ready? These were just some of the considerations.

In the end, our research showed that it would not be possible for us to bring the product to market. If you've been waiting for it, we can only say, we are sincerely sorry, we really wanted the Atari BI-80 to happen as well.

Finally, we want to be sure that all Atari owners and enthusiasts know that we at Batteries Included are still committed to the Atari software marketplace and will continue to create and publish our finest software for both the Atari XL/XE and ST markets.

Between now and next spring we intend to bring to market upgraded editions of both Homepak and PaperClip. Low cost upgrades for registered owners will be made available.

For the exciting new 68000 based ST's we plan on publishing not less than seven first class original programs during the coming nine months. These include; a magnificent new version of HomePak from Russ Wetmore; a powerfull drawing and graphics program (from a famous author I can't name just yet), and another unique program that I can't give details on right now, but is going to thrill a lot of people. More hopefull, in a few weeks.

Batteries announced recently a major high-end line of software called the I*S series; Integral Solution for the IBM PC under GEM. This integrated line, includes a Portfolio Manager, a Time and Billing program for professionals, a Word Processor, Data Base Management System and a Spreadsheet. I can't tell you more, and this isn't the time or place in any event, but you can trust that they will each be state-of-the-art and really exciting.

We're looking forward to doing our best for the Atari community. Thanks for your understanding.

Michael Reichmann
Vice President, Development
Batteries Included

S.P.A.C.E. Membership Application

Name_____Phone_____Date_____

Address_____City_____State_____Zip_____

Equipment/System-Used_____

Area of interest_____

Special skills, interest, info which might be shared._____

Optional
information: Occupation_____Employer_____

Dues: \$14.00 per year - please inclose check with application.

Mail application and dues to:
St. Paul Atari Computer Enthusiasts
748 Amber Dr., Shoreview, MN 55112

WANT ADS

It is possible for members to place 'Want Ads' in this newsletter. The ads may be for selling used hardware, used software, tutoring services, or just about anything that has to do with Atari. The rates are as follows:

6 Lines	\$1.00	216 Letters
1 Line	.25	36 Letters

The following is a list of advertising rates for vendors or individual members.

Full page	\$18.00	7-1/2" X 10"
Half page	10.00	3-5/8" X 10"
Half page	10.00	7-1/2" X 5"
1/4 page	5.50	3-5/8" X 5"

All advertisements must be paid for when they are submitted. Deadline for ad placement is two Mondays before the meeting. To place ad or for more info, call the editor.

St. Paul Atari Computer Enthusiasts
2589 Fisk St.
Roseville, MN 55113

Meeting site:
U of M St. Paul campus
Office Classroom Bldg. rooms B-35 & B-36
St. Paul, Minnesota

St. Paul Atari Computer Enthusiasts
2589 Fisk St.
Roseville, MN 55113-3406

U of M St. Paul campus
Classroom Office Bldg.
Rooms B-35 & B-36
St. Paul, MN

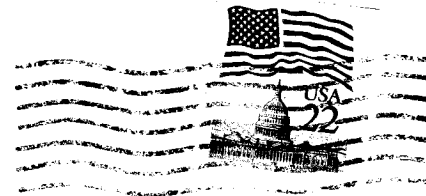
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